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By L. H. Bailey

6. Thrinax

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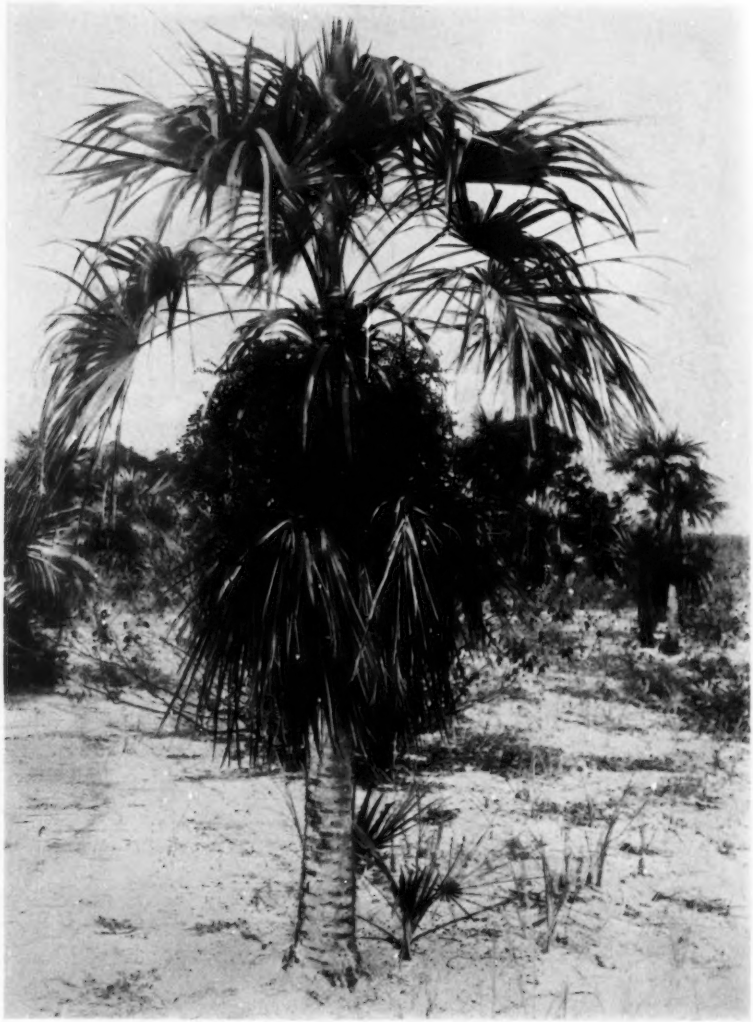


75. GOOD TREE of *Thrinax microcarpa* on Marquesas Key west of Key West, the uninhabited island where Sargent in 1886 collected the palm he later named *Thrinax keyensis;* Coccothrinax in the right distance.

L.
H. Bailey
23-37

ARTICLE 6. THRINAX — THE PEABERRY PALMS.

Olof Swartz of Sweden, born 1760, visited North America and Jamaica in 1783; he went to South America and the West Indies, again visiting Jamaica, in 1785; the following year he went to England, and there studied the Hans Sloane Jamaican collections. He recognized three palms as requiring record and diagnosis, making for one of them the genus Thrinax, although the word itself was suggested by the younger Linnæus, utilizing the Greek word for *fan* in allusion to the shape of the leaves.

He prepared three main works based on his West Indian collections: Nova Genera et Species or Prodromus, 1787; Icones, 1794; Flora Indiæ Occidentalis in three volumes, 1797 to 1806, in which the palms are given sufficient diagnosis to establish identity. His one species of Thrinax is *T. parviflora*, of Jamaica and Hispaniola. Now, one hundred and fifty years later, we pay homage to his memory and review the genus he founded.

Swartz became associated with scientific and educational institutions in his native land. He wrote on many botanical subjects, as lichens and mosses and ferns, and was one of the men in Sweden at that period who continued the great work of Linnæus. He died in 1818. He is remembered in the genus Swartzia, leguminous plants of tropical regions.

Besides the three large works mentioned above, Swartz published still another of considerable extent, "Observationes botanicæ quibus plantæ Indiæ occidentalis aliæquæ systematis vegetabilium ed. XIV illvstrantvr earvmqve characteres passim emendatvr — cum tabvlis æneis — avctore —" Erlangæ 1791; also some ten minor papers exclusively on West Indian plants and numerous scattered diagnoses of them in other connections.

The Thrinaces are fan-leaved single-trunked erect palms but often very slender and tall. Flowers are minute and numerous, borne on interfoliar spadices. The fruits are pea-like in size and often hang profusely in many compact short clusters, each one provided with a single very hard little seed. The flat leaves are much employed for roofing, and the plants are therefore known as thatch palms; but inasmuch as many kinds of palms are similarly useful it is not advisable to adopt the appellation as a formal vernacular name.

Two comprehensive treatments of Thrinax have appeared, both by Beccari the Italian, who died in 1920. These are in volume ii of Webbia, published in Florence in 1907, when nearly a dozen species were recognized;

and in a posthumous work published in 1931 in Annals of the Royal Botanic Garden, Calcutta, when thirteen species appeared.

Genus Thrinax is wholly American, the species ranging from southern Florida and the Bahamas southward in the West Indies to the Anguilla islands just beyond Puerto Rico. Outside Florida, where they are practically insular, we have little knowledge of Thrinax on a continental mainland. Materials from Yucatan are insufficient for determination, and the occurrencies in British Honduras are as yet in doubt. Several of the described species are yet imperfectly understood, and more critical field studies are required to elucidate them. Various species are planted in southern Florida and in the tropics; only rarely are they seen under glass.

The Thrinax group was clarified in 1899 when Charles Sprague Sargent separated Coccothrinax (Bot. Gaz. xxvii, 87). Separation of the latter genus, now accepted by all botanists, is based principally on the irregular content of the seed, which "is vertically sulcate by the infolding of the testa into the ruminate albumen." Exterior of the seed shows the grooves of the internal structure. These differences between Thrinax and Coccothrinax are shown in Fig. 76.

When ripe and dry the divisions of the seed in Coccothrinax may separate at the top as if they were carpels. Even when the seed has not fully developed within a fruit, the experienced observer is able to recognize the genus, for in the shrivelled remains the hard intrusions are even then apparent.

The generic name Coccothrinax was made by Sargent "in allusion to the berry-like fruit." The Thrinaces in Florida, where he studied the plants, bear a drupaceous and ivory-white fruit whereas fruits of the Coccothrinaces are baccate and black; this difference holds substantially in other than the Floridian species but not constantly; fruits of certain Thrinax species are gray to purplish. As the species of the two genera become better known we cannot hold confidently to separation between them on the exterior character of the fruit. In Coccothrinax the spadices are usually much shorter than in Thrinax (mostly shorter than petioles), stamens commonly more than 6, leaf-segments likely to be conspicuously drooping and usually lacking in prominent longitudinal veining, thus differing in looks from most kinds of Thrinax; trunks often covered with very coarse open-work hard stiff sheaths, whereas the covering in Thrinax, if any, is usually fine and soft or even woolly.

Inasmuch as Thrinax is a very old name it is not surprising that many unlike palms have been referred to it before generic limitations were well made out. Some of the earlier specific names are now to be sought in such widely diverse genera as Acanthorrhiza, Trithrinax, and Tessmanniophœnix.

THRINAX, Linn. f. ex Swartz, in Linn. Gen. Plant. ed. Schreber, ii, 772 (1791); Fl. Ind. Occ. i, 613, t. 13 (1797).

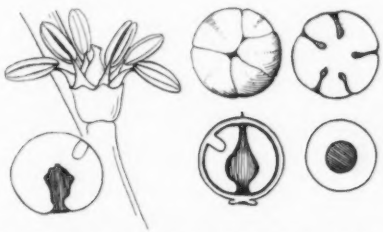
Porothrinax, Wendl. in Grisebach, Cat. Plant. Cub. 221 (1866).

Simpsonia, O. F. Cook, in Science, n. ser. lxxxv, 332-3 (Apr. 2, 1937).

Small unarmed trees, with more or less annular bare trunk, palmate leaves, interfoliar spadices, hermaphrodite minute flowers, many small pea-like more or less drupe-like single-seeded fruits: leaves slender-petioled, mostly segmented one-half or more the width of the blade, petiole smooth, hastula with a point or a rim projecting over plane of the blade: spadix usually equalling or exceeding petioles, branched, glabrous or partly so, provided with pointed spathelets at the nodes: flowers very small, consisting of a cup with 6 short lobes in a single series and no petals, the parts persisting at least for a time under the fruit; stamens 6 (sometimes 9?), attached on bottom of tube and more or less expanded and connate at base and the broad-based filaments sometimes mistaken for petals after the anthers fall, with long 2-celled introrse exserted anthers, often reflexed at full anthesis; ovary 1-celled, globular or short-oblong, passing upward into a columnar style with expanded and perhaps hollowed stigma: fruit globose, retaining the style, exocarp becoming succulent at full maturity but soon drying hard and at the fleshy stage white to gray to purplish (rather than black as in Coccothrinax) although blackish or brown when dry, glabrous at maturity but sometimes granulose, 10-12 mm. or less in diameter, bearing a free seed that is homogeneous in exterior and albumen but marked with a central cavity (centralium) lined with intrusion of integument partially or wholly extending through it longitudinally; raphe obscure; embryo and micropyle lateral toward apex as in Fig. 76.

Thrinax has been divided by Beccari into two sections, Euthrinax with the central column or wall-intrusion (centralium) extending completely through the albumen longitudinally (Fig. 76), and Typhlothrinax with the column extending only to about the center or at least not to the apex (Fig. 76). Euthrinax dates from Drude in Pflanzenfamilien, iii, 35 in 1889, and is taken up by Sargent in Garden and Forest, ix, 162 in 1896. Typhlothrinax is Beccarian, in Webbia, ii, 252 in 1907.

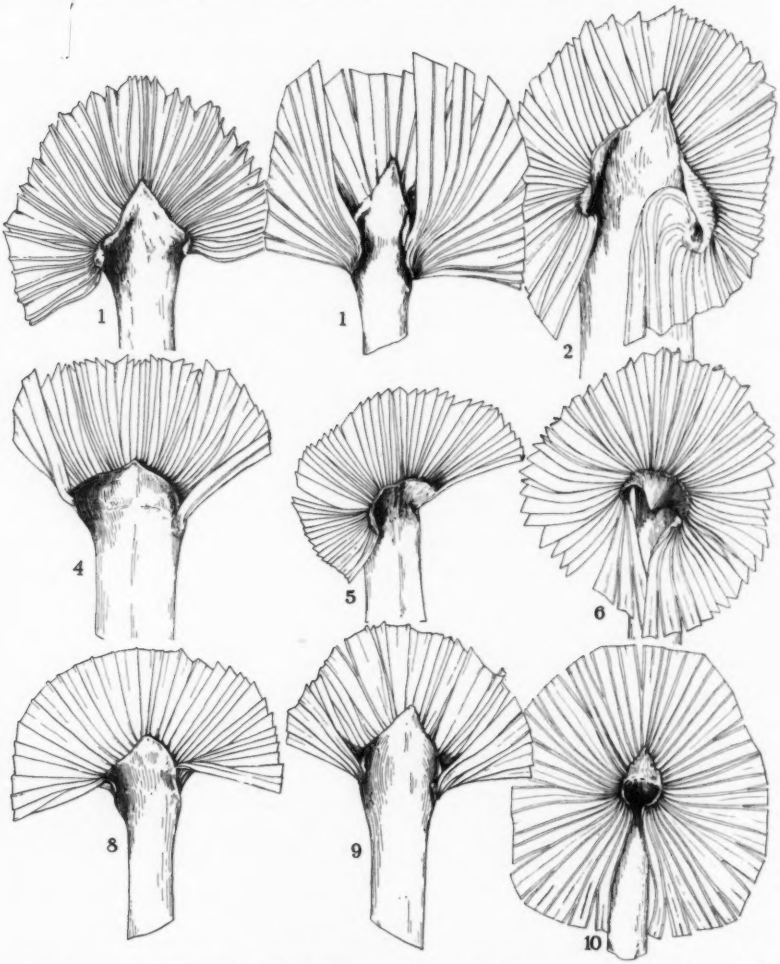
In the present paper I have not adopted these sections inasmuch as the species may vary within themselves in the extent of the centralium in the seed; and for practical purposes this character may not be clear to one who is not skilled in cutting the hard seed, inasmuch as a slightly diagonal section may not expose the full course of the intrusion;



76. Details in Thrinax and Coccothrinax. Flower of *T. microcarpa*, about five times enlarged. Upper right, seed of Coccothrinax and cross-section of it, enlarged. Lower right, longitudinal and cross-section of *Thrinax parviflora*, enlarged, centralium extending base to apex. Left, *T. microcarpa*, centralium partial.

and, moreover, one may not be in possession of mature fruits when attempting to use a key. I have therefore preferred the Sargentian divisions based on the existence or absence of prominent pedicels.

We may pause to consider the genus Porothrinax, established by Wendland in 1866 in Grisebach's Catalogus Plantarum Cubensium on Wright's no. 3219e. Wendland apparently knew only the fruit, which he



77. HASTULAS IN THRINAX, about three-fourths natural size. 1, 1, *T. parviflora;* 2, *T. excelsa;* 4, *T. microcarpa;* 5, *T. Morrisii;* 6, *T. punctulata;* 8, *T. tessellata;* 9, *T. Harrisiana;* 10, *T. Drudei.*

characterized as follows: "albumine centro perferato, margine haud ruminato." Sargent states (Garden and Forest, ix, 162) that in Porothrinax "the flowers are nearly sessile." This opinion is denied, however, by Wright's 3219e preserved at the Academy of Sciences in Havana, in which the pedicels are 1.5 and 2 mm. long. The specimen is apparently the plant known to us as *T. parviflora*, and Wendland's *Porothrinax pumilio* may be regarded as a synonym of the Swartzian name. The name *Thrinax pumilio* comes down from Loddiges, however, as published by Schultes in 1830. Schultes had only a young plant, and he borrowed mention of an embryo from Martius. We do not know what plant or plants were intended by Loddiges and Schultes. Martius gives a brief description in 1838, Historia Naturalis Palmarum, iii, 256, ascribing his palm to Jamaica; his picture of the seeds, t. 103 fig. iv, depicts what we now understand as *T. parviflora*.

It was a century after Swartz before critical study of the species of Thrinax, at least in the modern method, was undertaken by Charles Sprague Sargent in his extensive and continuous investigations of North American trees. In his paper in 1896 in Garden and Forest, Sargent recognized *Thrinax parviflora*, Swartz, as growing on the Florida keys although the seed he described under that name is now Coccothrinax. Another species, with sessile fruit, he described as *T. microcarpa*. These two species, *T. parviflora* and *T. microcarpa*, represent the two sections of the genus, by whichever name we designate the groups. If the student understands these two, all the other species fall readily into place.

In his paper on New North American Trees in Botanical Gazette in 1899 Sargent separated the Florida pedicellate species from *T. parviflora* of the West Indies and named it *Thrinax floridana;* he also established another Floridian species, *T. keyensis*, and founded the genus Coccothrinax. Various confusions in descriptions and portraits of the species appeared at this epoch, but these we are now able to eliminate.

Sargent's early publications were soon followed by O. F. Cook's determinations of the group in Puerto Rico, in 1901, and by the extensive field work of N. L. Britton in the West Indies. Britton wrote in 1908 in Torreya that Thrinax "is probably the most difficult of the American palm genera to understand, inasmuch as the foliage of most species is very similar and the differences in flowers and fruit are very slight." Any subsequent student of the genus will be sympathetic with this estimate; but many of the difficulties vanish if one knows the plants in the field, has really good herbarium material, and does not assume he must necessarily recognize all the species that have been described. Differences one draws diligently from poor herbarium sheets may disappear in the living plant.

In the present study of Thrinax, which has been in progress for some years, I have profited by the studies and specimens of the persons just

mentioned, whose materials I have consulted, and also by Dr. John K. Small and in Cuba by the careful aid of Brother León; and other persons have aided.

By the present subjugation of *T. floridana*, *T. keyensis* and *T. Wendlandiana*, as well as definition of the old *T. excelsa*, the genus begins to clarify itself. I should not now consider Thrinax to be the most difficult of the American palms, but reserve that distinction probably for Sabal.

Key to the Species of Thrinax

I. PEDICELLATÆ, Sarg. in Bot. Gaz. xxvii, 84 (1899).

Flowers and fruits distinctly pedicellate throughout the inflorescence, the pedicel of the fruit being usually as much as 2 mm. or more long (when fruits are fallen, the pedicels remain on the rachillæ conspicuously, Figs. 78, 81); centralium usually extending through the seed from bottom to top as seen when the seed is squarely cut (with more or less exception sometimes in No. 2).—THE PARVIFLORA SET.

A. Spathelet (floral sheath) small, not expanded away from the rachis or produced into a free blade (Fig. 81), usually glabrous or essentially so except in No. 2.

B. Mature dry fruit small, 6 mm. across or sometimes only 5 mm., globular, gray, with a thin pimpled not wrinkled shell: foliage green, or sometimes indifferently lighter colored underneath but not whitish or silvery, the segments narrow or not often exceeding 3.5 cm. broad; hastula normally long-pointed.....1. *T. parviflora*.

BB. Mature dry fruit larger, 8 mm. or more across, somewhat flattened endwise, yellowish to whitish, smooth when fresh, wrinkled in age from contraction of the fleshy exterior: foliage glaucous or whitish underneath, segments often 5 or 6 cm. broad: spathelets with fugacious furfuraceous or cottony covering.....2. *T. excelsa*

AA. Spathelet large, firm or thick in substance, with a short free end that may be 5-8 cm. broad at its base (Fig. 82), the exterior finely pubescent: foliage strongly many-ribbed, silvery underneath, segments to 8 cm. broad...3. *T. Rex*

II. SESSILIFORÆ, Sarg. l. c.

Flowers and fruits sessile, or if any of them shortly pedicellate then only at the base of the rachillæ; the apparent stalklet (if any) in this Section is little more than the brief fruit-base together with attached marcescent floral envelopes; centralium extending only part way through the seed except variously in Nos. 8-10.—THE MICROCARPA SET.

A. Centralium short and blunt, extending only part way (usually one-half or less) through the nutlet or seed.

B. Leaves with very thin or inconspicuous secondary longitudinal veins, not prominently glaucous-white underneath although perhaps silvery, and green on upper surface: fruit probably not pruinose.

C. Dry mature fruit about 5 mm. or more in diameter when full grown and developed.

D. Spathelets (sheaths on spadix) markedly pubescent or even lanate at least on blade: tall tree, foliage commonly silvery underneath; hastula rounded.....4. *T. microcarpa*

DD. Spathelets glabrous or essentially so: plant very dwarf, the leaves not silvery underneath.....5. *T. Morrisii*

CC. Dry fruit very small, 4 mm. or less in diameter: leaves minutely point-dotted underneath and silvery.....6. *T. punctulata*

BB. Leaves with strong prominent secondary veins, and decidedly glaucous underneath and glaucous-green on upper surface: fruit pruinose.7. *T. Ekmanii*

AA. Centralium for the most part continuous through the nutlet from base to apex, or sometimes not complete in No. 9.

B. Dry fruit 7 mm. in diameter and tessellate or checkered on surface: leaves either green underneath or somewhat lighter colored.....8. *T. tessellata*

BB. Dry fruit 6 mm. diameter, granulate: leaves dull gray-green underneath ..... 9. *T. Harrisiana*

BBB. Dry fruit 4 mm. diameter, smooth: rachillæ purple, very thin and slender: leaves lightly silvery underneath ..... 10. *T. Drudei*

1. **Thrinax parviflora,** Swartz, Fl. Ind. Occ. i, 614, t. 13 (1797). Figs. 76, 77 no. 1, 78, 79, 80, 81.

Thrinax pumilio, Martius, Hist. Nat. Palm. iii, 256, t. 103 fig. iv (1838).

Porothrinax pumilio, Wend. ex Grisebach, Cat. Plant. Cub. 221 (1866).

Thrinax floridana, Sarg. in Bot. Gaz. xxvii, 84 (1899).

Thrinax Wendlandiana, Becc. in Webbia, ii, 265 (1907).

Thrinax excelsa, Britton (non Grisebach), in Torreya, viii, 240 (1908).

Slender erect tree 3-9 m. tall and probably more, trunk enlarged at base, the bole at middle 1 dm. or more in diameter and obscurely if at all annular: head on tall or old trees small and condensed, the closely placed mature light green leaves 1 m. or more across: petioles 6 dm. to 1 m. long, thin and 2-edged with the central line only slightly elevated or obscurely ridged, lower end with many marginal long fibers and base inclosed in more or less woolly sheathing and which is often very prominent, hastula broad and with low upturned margin and the middle produced into a prominent triangular point or prong although this projection sometimes does not develop characteristically on certain leaves (point sometimes replaced on a leaf of the same tree by a retuse formation at apex of hastula, due to splitting): blades cut nearly to center into 50 or more segments mostly narrow but frequently 3 cm. or somewhat more broad at widest part, longitudinal veins light either side the strong midrib and surface punctulate underneath, tips not excessively narrow-pointed and sometimes only shortly so, under surface only slightly lighter in color than the upper and not glaucous-white: spadix 1 m. long more or less and producing perhaps a dozen clusters each of which issues from a small closed glabrous striate sheath or spathelet the uncovered part of which is 4-8 cm. long and point only bluntly acute; separate alternate clusters overcurved, 8-20 cm. long at full extension, bearing simple branches 4-8 cm. long on the main axis: flowers rather closely placed, variable in size of calyx divisions as well as length of anthers and development of style, but anthers longer than filaments and the stigma expanded as if urceolate: fruit almost perfectly globular, commonly 6 mm. diameter either way but frequently somewhat smaller, drying regularly with a thin brittle shell that is finely granulate or pimpled: seed or nutlet 4-5 mm. diameter, plane, the axial median section showing a broad hollow column or centralium somewhat expanded at middle and extending from base to apex; embryo then showing at upper side (left or right depending on the depth of the cut).

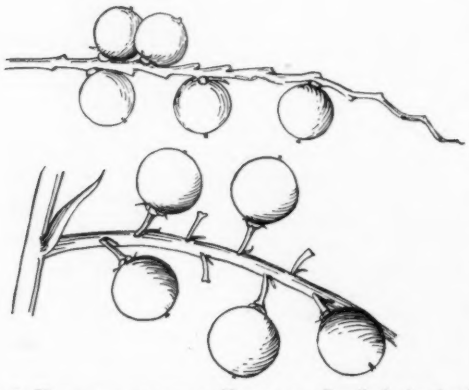
Widespread species in proximity to the sea, on the Florida keys and shores, North Cat Cay as stated by Britton in The Bahama Flora, Cuba,

Jamaica, Haiti, and reported on mainlands in Yucatan and British Honduras although materials from these continental ranges are possibly misinterpreted.

Type locality: "Habitat in maritimis et aridis Jamaicæ, Hispaniolæ," *Swartz.*

In Florida the northernmost definitely published limit for *T. parviflora* is at Cape Romano on the western coast, in Collier County, where it was discovered by A. W. Chapman in 1875, and "in a scattering way" in the neighboring Ten Thousand Islands as stated by John K. Small in 1925 in his interesting historical paper on the "Silk-top Thatch" (Journ. N. Y. Bot. Gard. xxvi, 54). The Cape Romano location is said to have been destroyed. On the east coast Small records a single tree at its northern point on Ragged Key No. 6, which is on the outer rim of Biscayne Bay (Fig. 79). On the keys farther south "the growth is phenomenal," he says; "or at least it was, before the lust for destroying every living thing reached these islands with the advent of civilized man. Thatch hammocks clothed large and small areas, just as do those of the cabbage tree on some parts of the mainland, but instead of the ponderous and massive effect of the cabbage trees, the light and graceful port of the thatch gives an entirely different aspect to the landscape. The pale trunks are so slender and so inconspicuous that at a distance the crowns of leaves seem to be suspended in mid-air."

A more northern record of a native undetermined Thrinax, apparently not now standing, was published in the Journal of the New York Botanical Garden, volume xxiii, 152, from the Lake Worth region, much north of Miami. This palm was later referred to *T. parviflora.* This station is north of the Cape Romano area.



78. THE TWO GROUPS IN THRINAX. Sessile fruits (and flowers) above; pedicellate below. *Thrinax microcarpa;* and *T. parviflora;* enlarged.

I regret that I must differ from my predecessors in interpretation of *Thrinax parviflora,* but am reassured by the remark of Beccari in The Palms Indigenous to Cuba (p. 403) that "perhaps *T. Wendlandiana* is not sufficiently distinct, as a species, from the true *T. parviflora* growing in Jamaica; and, probably, it is only a geographical form of this latter species."

Definite identification point for *T. parviflora* is the picture published by Swartz and reproduced practically same size in Fig. 80. The item *g* is the fruit and *k* the nucleus or nutlet natural size in Swartz, and these establish dimensions on which we must base identification. The items in the picture are: *a*, flower natural size; *b*, same enlarged; *c*, calyx enlarged; *d*, stamen enlarged; *e*, pistil in the calyx enlarged; *f*, pistil enlarged; *g*, fruit natural size; *h*, fruit enlarged; *i*, transverse section of fruit presumably natural size; *k*, nutlet natural size; *l*, transverse section of nutlet, presumably natural size.

In Naturhistoriska Riksmuseet, Botaniska Avdelningen, Stockholm, are three historic sheets supposed to represent the *Thrinax parviflora* of Swartz. These I have had the privilege of examining through the courtesy of Dr. E. Asplund. Beccari had seen them and had marked each of them as type specimen of *T. parviflora*. One of them bears also a spathe of a Bactris, which Beccari also noted, but this Bactris is neither the Jamaican nor the Hispaniolan species; and there are other elements of doubt.

One of the Stockholm sheets is legended "Jamaica, *Swartz*." It comprises an entire very young leaf and a pocket of flowers that match the Swartzian picture (Fig. 80). The leaf represents the palm I have just discussed, and it shows the narrow triangular projection of the hastula so characteristically associated with *parviflora*. The sheet is legended also "Thrinax parviflora Swz." The writing is in the hand of J. E. Wikström, Director of the Botanical Museum and the Botanical Garden of the Royal Academy of Sciences

79. Farthest North on Florida East Coast of *Thrinax parviflora*, on Ragged Key No. 6, outside Biscayne Bay. Photograph by John K. Small.

at Stockholm 1818-1856. This sheet undoubtedly may be considered authentic *Thrinax parviflora* of Swartz.

A second sheet is legended "Jamaica, *Swartz*" in Wikström's hand and also by him "Sabal umbraculifera Mart." The sheet bears three pieces of spadix from which fruits have fallen; these pieces are undoubtedly *Thrinax parviflora*.

The third sheet, which I have mentioned as bearing a spathe of Bactris, has also a piece of Thrinax spadix in very young fruit and apparently *T. parviflora*. There is no locality on this sheet but the history seems to be clear that the specimens were given by Linnæus to Dahl and from him to Alströmer. The Alströmer herbarium came to the Stockholm Museum in 1848. There is no indication that this third sheet was ever seen by Swartz.

Clas Alströmer, 1736-1794, was a Swedish nobleman who had a botanical garden and museum at Gothenburg. Andreas Dahl, 1751-1789, was employed as keeper. Both men had been pupils of Linnæus. Their names are familiar to us in the genera Alstroemeria, founded by Linnæus, and Dahlia established by the Spaniard Cavanilles.

In some cases Swartz did not bring specimens home with him but described the species from fresh material when he was in the West Indies. He also gave many of his type specimens to Sir Joseph Banks and such things may now lie at the British Museum or at Kew, but these palms appear not to be there. Swartz quotes "Brown: jam. 190" (Patrick Browne, Natural History of Jamaica) but apparently drew his descriptions from specimens inasmuch as he gives characters not in the Browne account.

When Sargent undertook the study of Thrinax for the Silva he attributed *T. parviflora* to Florida as well as to "the Bahama Islands and many of the Antilles" (Silva, x, 1896). In a subsequent volume he separated the Florida plant as *T. floridana* (Silva, xiv, 1902), having been guided by Charles Wright's no. 2329 collected in Cuba and determined by Wendland as *T. parviflora* but which Sargent thought to be distinct from the Florida plant. I have examined Wright 2329 at the Arnold Arboretum and the Gray Herbarium and do not care at present to pronounce on it; but no real distinctions have yet been drawn between the Floridian and Antillean palms of the *parviflora* set.

80. SWARTZIAN DETAILS of *Thrinax parviflora*, 1797. *g*, *i*, *k*, *l*, fruit and nutlet about natural size; *h*, fruit enlarged; *a*, *b*, flower, former about natural size; *c*, calyx; *d*, *e*, *f*, stamen and pistils, enlarged.

In his Manual of the Southeastern Flora, 1933, John K. Small unites *T. floridana* with *T. parviflora* and questions the standing of *T. Wendlandiana*.

In Jardim Botanico, Rio de Janeiro, some years ago I saw a palm ticketed "*Thrinax sapida* Lodd." I do not know such a binomial, but the plant was *T. parviflora*.

If there are specific differences in the variable *parviflora* set, as here constituted, they must be determined from far better materials than are yet preserved in the herbaria, and new characters must be drawn.

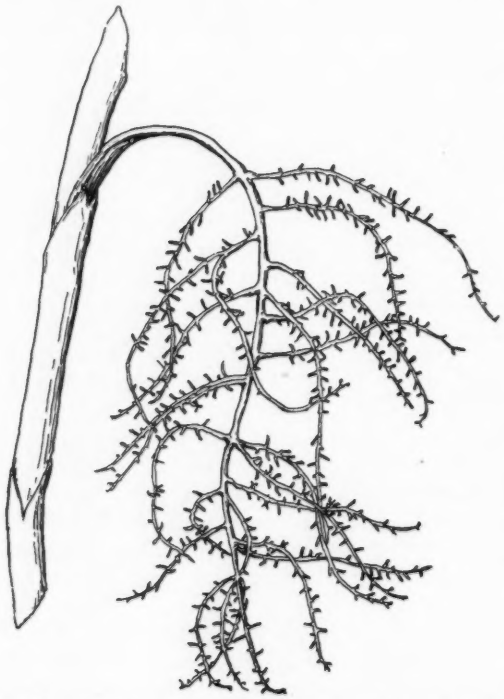
2. **Thrinax excelsa,** Grisebach, Fl. Brit. W. Ind. 515 (1864); J. D. Hooker, in Bot. Mag. t. 7088 (1889). Fig. 77 no. 2.

Sturdy but not big-boled palm to 6 m. or more tall, with prominent broad hanging leaf-segments, the blade much lighter colored or whitish underneath and glossy above, spadices equalling leaves or a little shorter, bole obscurely ringed and variously enlarged or sometimes bulged at base: leaves firm, the topmost with erect or ascending segments, secondary veins (between the main very stout ribs) about 10 and prominent at least on the under surface and many cross-hatches between them, main segments 5-6 cm. across at middle or base, the points usually not long-produced; petiole strong, 3 cm. broad toward base, blunt-edged, both surfaces only obscurely convex and not ridged, hastula large and with rolled margins and a broad upward projection in center and from which the stiff ribs diverge: spadix 1-1.75 m. long, bearing many short clusters with divaricate branchlets, nearly or quite glabrous throughout; spathelets fuscous pubescent or cottony, at least at first; pedicels very long (to 5 mm.); calyx shallowly and mostly bluntly lobed or scalloped, anthers long on short filaments, style short and stout: fruit 9-11 mm. crosswise when fresh and mature and 8 mm. or more when dry, flattened at ends and at apex with prominent depression in the pulpy white flesh, the axial diameter less than the transverse, drying into a puckered or somewhat wrinkled body 1 or 2 mm. less in diameter but which becomes more or less smooth when lying long on the ground or when picked before full maturity; centralium narrow, extending through the nutlet with a thin terminal end or sometimes not quite reaching the other periphery.

Known to me as a living plant only in cultivation in Jamaica, Cuba, Trinidad, Ciudad Bolivar on the Orinoco, and British Guiana. It is conspicuous in its ample bright green or yellowish-green leaves lighter colored underneath, full broad segments, and white or nearly white soft-fleshed bead-like large berries; petiole broad, obtuse at margins and compressed. It is a handsome palm. I have seen it in cultivation under the names *T. parviflora* and *T. floridana*.

I take Britton no. 4099 to be this palm, collected in the wild in a coastal thicket at Morant Point, St. Thomas, Jamaica, March 1909; and probably also his 892, "abundant and gregarious" on limestone rocks on Priestman's River, Portland, Jamaica, September 1908. Britton considered these palms to be true *T. parviflora*.

A binomial *Thrinax excelsa* appears in Loddiges' Catalogue of Palms in 1849, only in a list and without description and with Cayenne as the habitat. There is no means of knowing what plant Loddiges may have had, and Thrinax is not known to be native at Cayenne. As the title is a *nomen nudum* and about ninety elapsed years have still further obscured it, there is no point in trying to revive the name and of course it cannot invalidate the use of the name again in the genus. The nomial was taken up, with diagnosis, by Grisebach in 1864 for a plant inhabiting Jamaica, with the identification "*Hort. Kew.*" This plant flowered under glass at Kew and was figured in Botanical Magazine t. 7088 (1889), the species being accredited as *Thrinax excelsa*, Grisebach. The text by J. D. Hooker asserts that the Kew palm is the "very specimen" described by Grisebach; the herbarium material of it is therefore the preserved type of the species. The palm produced "fully formed globose pale yellowish-white fruits, about half an inch in diameter, with a rather thick dry spongy pericarp and a globose seed, which, however, contained no perfect embryo." N. L. Britton took up the name but for a small-fruited palm in Jamaica and his specimens look to me to be *T. parviflora*.



81. THE SPATHELET OR SHEATH (UNDER PEDUNCLE), AND OLD INFLORESCENCE, of *Thrinax parviflora*, drawn from the Swartzian specimen; about one-half natural size.

In his monograph of Thrinax in Webbia, ii (1907) Beccari refers *T. excelsa* of Botanical Magazine t. 7088 to *Coccothrinax argentea* with a question (p. 254); this reference is retained in his great palm paper published posthumously in 1931 in Annals of the Royal Botanic Garden, Calcutta, p. 331. The plate 7088 bears more marks of Thrinax than of Coccothrinax, however, in leaves and spadices. I therefore

asked Kew whether specimens were preserved and if the fruits were sufficient for generic determination. Examination was made and the species was found to be a Thrinax. "The albumen of the seeds is plain except for a central columnar cavity."

The palm I now call *Thrinax excelsa* was recognized by me some years ago as distinct, in cultivation, and I had named it a new species, and diagnosis was incorporated in this manuscript when report was received on plate 7088; I am therefore relieved to be able to bring up a good old name for it. The large fruit vrinkled when dried and fuscous cottony fresh spathelets are characteristic.

3. **Thrinax Rex,** Britton & Harris, in Bull. Torr. Bot. Club, xxxvii, 352 (1910). Fig. 82.

Large striking tree at full growth, to 20 m. tall, bole to 2.5 dm. diameter and sometimes swollen at base, the leaves very large (3-4 m. across), silvery underneath and light green above, the latest expanded leaf in the crown of the smaller trees assuming an erect position like a great open fan: leaf-segments about 50, to 8 cm. broad, very strongly ribbed lengthwise and prominently cross-veined, long-attenuate to the rigid points; petiole very stout, equalling or exceeding the blade, flattened and 2-edged, the hastula triangular-acute and about 2.5 cm. long: spadices much shorter than the leaves, marked by very large pubescent spathelets or sheaths that are 20 cm. long and bearing a short projecting bluntish end 5-8 cm. broad; separate flower-clusters strongly reflexed, divaricately branched, the rachillæ to 15 cm. long; pedicels 1.5-2 mm. long: calyx-teeth short and broad, abruptly acute but not acuminate: fruit nearly globular, 6-7 mm. diameter, smooth; seed practically globular, 5 mm. diameter, dark brown and usually shining, often marked with lines, the narrow centralium extending from base to apex as seen in longitudinal median section.

Woods in scraggy limestone areas at 450-600 m. altitude, on the eastern slopes of John Crow Mountains, eastern Jamaica, *10,759 Harris & Britton, 4151 Britton.*

4. **Thrinax microcarpa,** Sarg. in Garden and Forest, ix, 162 (1889). Figs. 75, 76, 77 no. 4, 78, 83, 84.

Thrinax keyensis, Sarg. in Bot. Gaz. xxvii, 86 (1899).

Thrinax præceps, O. F. Cook, in Bull. Torr. Bot. Club, xxviii, 536 (1901).

Thrinax ponceana, O. F. Cook, l.c. t. 45.

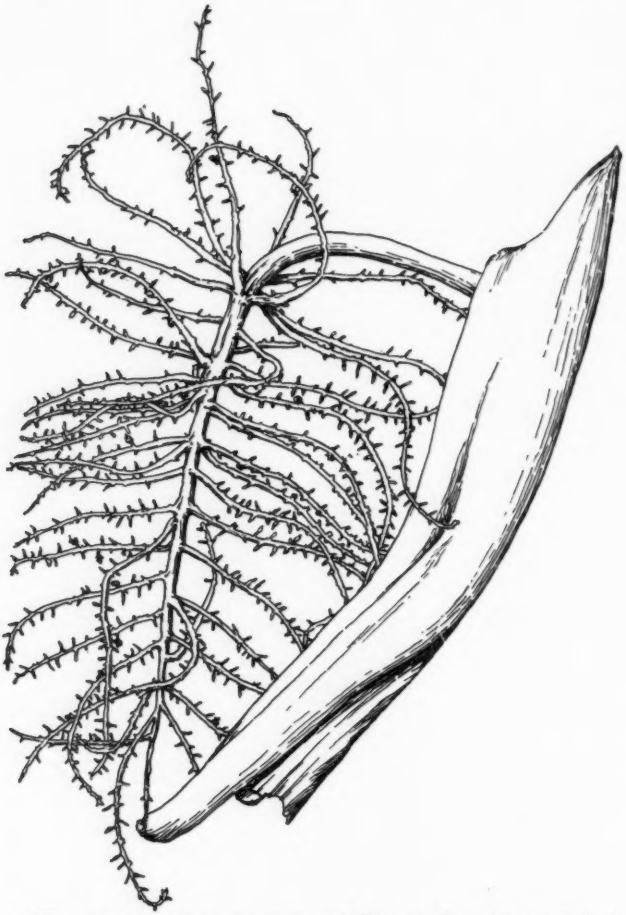
Thringis laxa, O. F. Cook, l.c. 545.

Thrinax bahamensis, O. F. Cook, in Mem. Torr. Bot. Club, xii, 20 (1902).

Coccothrinax laxa, Becc. in Webbia ii, 333 (1907).

Simpsonia microcarpa, O. F. Cook, in Science, n. ser. lxxxv, 333 (1937).

Stout often stocky tree said to reach 10 m. tall over all but usually much less; bole hard and durable, commonly not more than 3 or 4 m. high and often much less at fruiting time, rings nearly or quite disappearing in age, base enlarged by masses of tight root-like growths (Fig. 84); top or crown open, due to the very long petioles, spadices equalling or exceeding the leaves at least when in fruit: leaves usually without hanging segments although the entire blade may eventually hang, lively shiny green above and lighter colored to silvery underneath, deeply divided into segments 4 cm. or less broad, secondary veins not evident, sometimes cross-hatched, points long and narrow; petiole slender, lightly convex, accompanied by



82. THE BIG SPATHELET AND CLUSTER of *Thrinax Rex;* about one-third natural size.

much webbing at the expanded base, hastula broad and rounded although perhaps bearing a short projection at the center: spadix with short pubescent or lanate spathelets: flowers very small, sessile, calyx a short indistinctly lobed cup, proterandrous, the anthers narrow and much exceeding the filaments, style short and with expanded stigma: fruit white at fresh maturity, closely placed on the rachillæ, small, 5 mm. across when dry or sometimes a little less or more, practically globular, surface smooth or finely granular; nutlet 3-4 mm. diameter, the centralium broad-obtuse and extending about one-half the axial diameter.

Most widely spread of the Thrinaces, as far as known, from the upper keys on the east coast of Florida (Elliott's Key, southward) and the Cape Sable region, Bahamas, Cuba, Jamaica, Hispaniola, Puerto Rico; also supposedly in Yucatan and British Honduras. This species is abundant on the Bahama Islands. On the west side of Andros Island I have seen it stretching for miles on low ridges beyond the swash, making continuous stands; trunks reach 10-12 feet high and 9 inches in diameter near base above the fiber; leaves silvery underneath, the white covering only partly rubbing off; petioles at base and the bole bearing thin webbing; spadices 3-6 feet long, often exceeding the leaves.

The *Thrinax keyensis* was founded on a collection made by Sargent on "the north shore of the largest of the Marquesas group of islands" that lies in the Gulf of Mexico west of Key West. The date was November 1886, and there were no flowers or fruits; such fruits as were taken on the island turned out subsequently to be those of the plant we have been calling *Coccothrinax argentea* (*jucunda*). Later, what was considered to be the same palm was found in the Bahia Honda group of islands northeastward from Key West and on the southern boundary of the Bay of Florida. Here the matter rested until August 1935 when I visited the uninhabited Marquesas, in company with H. H. Hume and son, and found the palm in both flower and fruit (Figs. 75, 83, 84). I have not been able to think it distinct from *T. microcarpa* of the other keys.

One sometimes notices slight differences in size and shape of dry mature fruits of *Thrinax microcarpa* but I have not been able to correlate these variables with distribution. Frequently there are considerable differences between mature fruits even on the same spadix.

5. **Thrinax Morrisii,** Wendl. in Gard. Chron. ser. iii, ix, 700 (1891) and xi, 104, figs. 20, 21(1892). Fig. 77 no. 5.

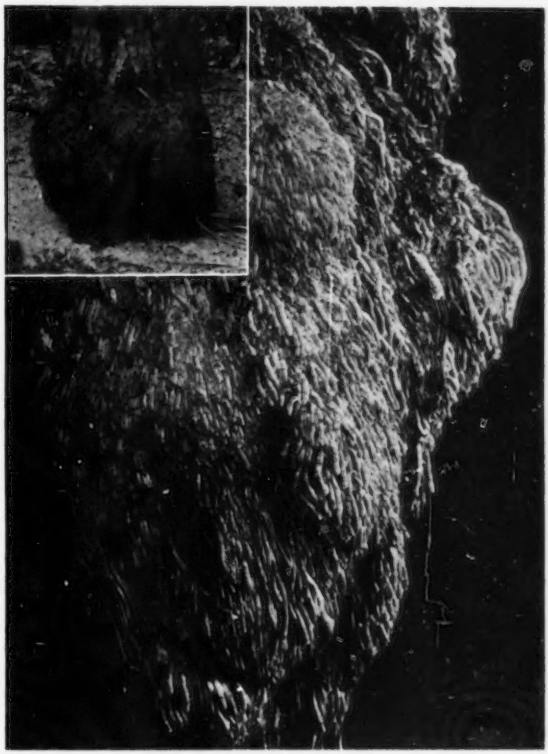
Very small or dwarf palm, fruiting in nature when 1 m. and less high although the trunk may become 2 m. tall and apparently more, rings little apparent in old or bearing plants, base of trunk bearing a mass of root-like cords or fibers: leaves to 1 m. across, shining green and somewhat lighter in color underneath, not stiff or rigid, intermediate veins scarcely

noticeable, segments to 4 cm. or less broad and not long-prolonged; petiole slender, convex on under surface and flattish or lightly ridged on upper, hastula with a rounded not revolute end and sometimes lightly emarginate or even with a bluntish cusp: spadix 1 m. more or less long, shorter than the leaves, glabrous, rachillæ relatively short and not conspicuously divaricate: flowers sessile, calyx sharply lobed, narrow anthers exceeding filaments, style short and stout with expanded oblique stigma: fruit

83. LEAF, WITH SPADIX IN YOUNG FRUIT, of *Thrinax microcarpa*.

globular, white, with a distinct point (when not broken off), about 5 mm. in diameter, dark brown, with nearly smooth surface; nutlet 3-4 mm. diameter, the narrow centralium extending one-half or somewhat more through it.

Anguilla and Anegada islands, east of Puerto Rico at the northern part of the Lesser Antilles chain, Anguilla being British and the other belonging to the Virgin Islands group. Attention was called to this palm by Daniel Morris, Assistant-Director of the Royal Gardens, Kew, in his Report of a Botanical Mission to the West Indies, presented to the Secretary of State for the Colonies, April 20, 1891: Kew Bulletin, 1891, 131. On Anguilla "an interesting little palm was found growing on broken limestone rocks. It was present in fairly large quantities, and the fan-shaped leaves were used for thatching native huts. The chief interest attached to this palm is connected with its dwarf habit. The largest and apparently most matured specimen did not measure more than about 30 to 35 inches in height and the stem was about $2\frac{1}{2}$ inches in diameter."



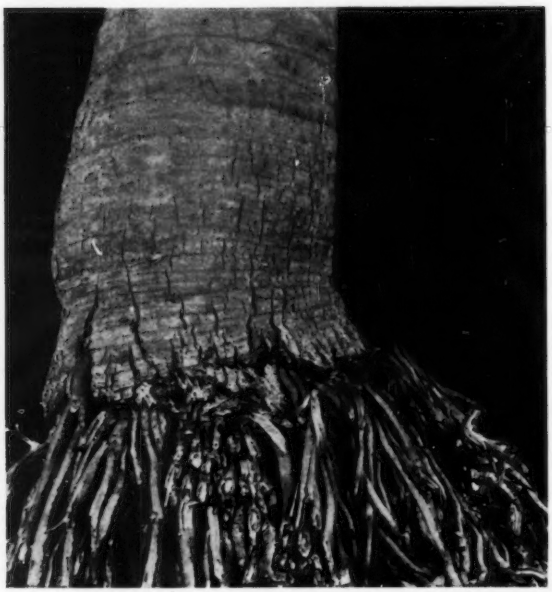
84. Basal coarse fiber of *Thrinax microcarpa* (*keyensis*), partly worn away, at base of trunk on Marquesas Key; inset, bottom of trunk, as it stands.

The Morris palm is in cultivation in southern Florida, and was once at least grown under glass in the North by a commercial firm.

6. **Thrinax punctulata,** Becc. in Webbia, ii, 280 (1907); Palms Indigenous to Cuba, 405 (Pomona Coll. Journ. Econ. Bot. iii, 1913). Fig. 77 no. 6.

Slender elegant palm said to attain 13 m. tall, the trunk only 7-8 cm. diameter and marked with rather obscure rings and bearing mass of rootlets toward base, aside from its slenderness distinguished from *T. microcarpa* by the very small fruit which is 4 mm. or less in cross diameter and the minute seed which is about 2.5 mm. diameter and punctiform about the hilum, the leaves rather prominently although minutely brown-dotted underneath as seen by a good lens: leaves divided almost to the base, silvery underneath, intermediate longitudinal nerves fine but prominent, cross-hatched strongly, segments 4.5 cm. or less broad and narrow-pointed, petiole slender and ridged, hastula with a prominent point: spadix exceeding leaves, glabrous or nearly so, the spathelet-ends small and rachillæ very slender: flowers sessile, calyx irregularly shallowly and rather bluntly lobed: fruit nearly globular and finely granular, 3-4 mm. diameter when dry; broad centralium extending about half way through the seed.

Cuba. On limestone cliffs in wooded country on Sierra de Esperón (Monte Guanajay of Beccari, Sierra de Guanajay), Province of Havana near the border of Pinar del Rio; not positively recognized elsewhere, other collections referred here probably being small-fruited specimens of *T. microcarpa.* I have visited the stand of this palm on the rugged Sierra de Esperón where it was originally collected by Van Hermann and subsequently by Brother León, and found the roots clinging in the white walls and the trunks often bent at base as they took an up-



85. Trunk-base as *Thrinax tessellata* appears high on cliffs beyond the Pantrepant entrance into the Cockpit country in Jamaica. Nearly one-half natural size; tree not mature.

ward direction; bole very thin, not uniform or regular in diameter, with few evident rings, showing much fibrous enlargement at base; leaves whitish underneath, side veins not prominent. Britton writes (Torreya, viii, 240) it "is very closely related, if not to be included" in the *T. microcarpa* aggregate. The very small fruit, however, gives it a distinctive character.

7. **Thrinax Ekmanii,** Burret, in Palmæ Cubenses et Domingensis a Cl. E. L. Ekman, 27 (in Kungl. Svenska Vetenskapsakademiens Handlingar, Tredje Serien, Band 6, no. 7, Stockholm 1929).

Small palm to 5 m. tall but usually less: leaves glaucous-green and shining above, conspicuously white-pruinose underneath, stiff, secondary longitudinal veins prominent, divided to about the middle into 60 or more segments that are 3 cm. and more broad at base, long-acuminate, manifestly cross-hatched above: rachillæ closely placed, glabrous, slender: flowers sessile; anthers narrow exceeding the filaments which are scarcely longer than the obtusely angled calyx: fruit globose, 5 mm. diameter, pruinose, lightly granulate; centralium extending about half way through the seed.

Navassa Island, between Haiti and Jamaica, *Ekman 10839.* I have seen Ekman's number in the herbarium of Department de l'Agriculture, Damien, Haiti; it appears to be a well-marked species. E. L. Ekman was a distinguished Swedish collector in the West Indies, who died in Santo Domingo in 1931.

8. **Thrinax tessellata,** Becc. in Webbia, ii, 271 (1907). Figs. 77 no. 8, 85.

Slender tree to 15 m. tall, the trunk 1.5 dm. thick and maintaining the same diameter top to near bottom: leaves green above and either green or probably oftener light colored underneath, strongly ribbed and secondary longitudinal veins pronounced, prominently cross-hatched, the long-pointed segments 3.5 cm. or less broad; petiole very slender, biconvex and the margins obtuse, hastula short and bluntly curved: lateral flower-clusters short; rachillæ rather short, drying into angled and punctate or tessellate surfaces: fruit sessile, spherical, 6-7 mm. in diameter at maturity when dry, stoutly pointed, gray, the surface closely angular-tessellate; centralium stout, extending through the seed from bottom to apex.

Jamaica: Holly Mount, in crevices of honeycombed limestone rocks, *Maxon & Collins, Harris, Britton, Bailey;* Union Hill, near Moneague, *Britton & Hollick;* near Mt. Pantrepant, Trelawny (Cockpit country), *Bailey,* on a high limestone precipice. The dull green softish foliage and checker-marked fruits distinguish it. "Seems very distinct," Britton (Torreya, viii, 240).

9. **Thrinax Harrisiana,** Becc. in Fedde, Repert. vi, 94-5 (1909). Fig. 77 no. 9.

Slender tree to 17 m. high, the trunk about 1 dm. diameter but often much less: leaves dull green or gray-green both surfaces, deeply divided into about 40 segments which are 4 cm. or less broad and long-pointed, secondary longitudinal ribs not conspicuous, surfaces cross-hatched and perhaps variously flecked with lighter color; petiole very slender and often exceeding the blade, biconcave and not ridged, about 1-1½ cm. broad at middle and the margins blunt or at least not sharp; hastula small, rounded or incurved-tubular but often with projection at the center: spadix slender, to 1 m. or more long, essentially glabrous even if somewhat mealy on the close short spathelets, the individual clusters small and the short rachillæ glabrous: flowers sessile or on a tubercle-like elevation or the lower ones on the rachilla perhaps shortly stalked and sometimes part of the fruiting pedicels evident, calyx shallowly and somewhat sharply toothed: fruit purplish at maturity, spherical and pointed, 6 mm. across, minutely granular or pimply; seed brown, about 4 mm. across, the centralium usually but not uniformly extending through it.

Jamaica: on and about Dolphin Head in Hanover, being a prominent slender tree: *Wm. Harris, Britton, Bailey,* at different times, to 500 or 600 m. and more altitude.

10. **Thrinax Drudei,** Becc. in Webbia, ii, 269 (1907); Palms Indigenous to Cuba, 404 (Pomona Coll. Journ. Econ. Bot. iii, 1913). Fig. 77 no. 10.

Thrinax multiflora, Sarg. in Bot. Gaz. xxvii, 84 (1899), non Mart.

Imperfectly known palm, founded on Wright 3965 as if it came from "Cuba orientali," 1859-1860, but probably from Pinar del Rio in the western end of Cuba where much of Wright's supposed oriental material was obtained and where this plant may have been found in recent time although the fruits of later collections are often 5 mm. diameter rather than 4 mm. (and seed 2-3 mm.) as in Wright, but Wright's are not mature. From *T. microcarpa* it is supposed to be distinguished by the centralium extending through the seeds as is shown in Wright's collection, but the material is yet too scant and undeveloped to determine this point with precision; the rachillæ are very slender, not even 1 mm. thick when dry, and purplish; leaves slightly silvery or even glaucous-white underneath; segments about 3½ cm. or less broad; secondary veins prominent; fruits sessile; plant itself undescribed.

New collections with fully ripe fruits and definite locality are required for further discussion. The species is dedicated to Oscar Drude, German student of palms.

IMPORTANT BINOMIALS IN THRINAX

acuminata, Grisebach & Wendl. nomen: Coccothrinax acuminata, Sarg.
altissima, Hort.: Coccothrinax.
argentea, Lodd.: Coccothrinax argentea, Sarg.
aurantiaca, Fulch.: ?
bahamensis, O. F. Cook: No. 4.
barbadensis, Lodd. etc. An indefinite name, apparently sometimes applied to *T. parviflora*. Beccari refers to it a palm from Guadeloupe that he makes Coccothrinax barbadensis, Becc. *Thrinax barbadensis* Ill. Hort. xxii, t. 194(1875) is Washingtonia.
compacta, Grisebach & Wendl.: Coccothrinax, as disclosed by Wright no. 3222 in Gray Herbarium.
crinita, Grisebach & Wendl.: Coccothrinax? crinita, Becc. Fruit of this palm has now been discovered, and it is definitely a Coccothrinax.
Drudei, Becc.: No. 10.
Ekmanii, Burret: No. 7.
elegans, Hort.: confused name.
elegantissima, Hort. The plant I have seen in California under this name, not in fruit, is apparently a Coccothrinax.
excelsa, Grisebach: No. 2.
floridana, Sarg.: T. parviflora.
Garberi, Chapm.: Coccothrinax argentea, Sarg.
gracilis, Hort.: confused name.
graminifolia, Hort.: Coccothrinax argentea, Sarg.
Harrisiana, Becc.: No. 9.
havanensis, Hort.: ?
keyensis, Sarg.: No. 4.
longistyla, Becc.: presumably Coccothrinax.
maritima, Lodd.: ?
Martii, Grisebach & Wendl. nomen: apparently T. parviflora, Swartz.
microcarpa, Sarg.: No. 4.
Miraguama, Walp.: Coccothrinax Miraguama, Becc.
Morrisii, Wendl.: No. 5.
multiflora, Mart.: Coccothrinax argentea, Sarg.
multiflora, Wright: No. 10.
parviflora, Swartz: No. 1.
ponceana, O. F. Cook: No. 4.
præceps, O. F. Cook: No. 4.
pumila, Fulch.: No. 1 probably.
pumilio, Mart.: No. 1.
punctulata, Becc.: No. 6.
radiata, Lodd.: Coccothrinax radiata, Sarg.
rigida, Grisebach & Wendl.: Coccothrinax rigida, Becc.
Rex, Britton & Harris: No. 3.
tessellata, Becc.: No. 8.
Wendlandiana, Becc.: No. 1.
Yuraguana, Rich.: Coccothrinax Miraguama, Becc.